



SECURITIES AND EXCHANGE COMMISSION
[Release No. 34-93237; File No. SR-Phlx-2021-56]

Self-Regulatory Organizations; Nasdaq PHLX LLC; Notice of Filing of Proposed Rule Change to Amend Options 4A, Section 12 Regarding the Closing Volume Weighted Average Price (“Closing VWAP”) for Listing and Trading of Options on the Nasdaq-100® Volatility Index

October 1, 2021.

Pursuant to Section 19(b)(1) of the Securities Exchange Act of 1934 (“Act”)¹, and Rule 19b-4 thereunder,² notice is hereby given that on September 23, 2021, Nasdaq PHLX LLC (“Phlx” or “Exchange”) filed with the Securities and Exchange Commission (“SEC” or “Commission”) the proposed rule change as described in Items I, II, and III below, which Items have been prepared by the Exchange. The Commission is publishing this notice to solicit comments on the proposed rule change from interested persons.

I. Self-Regulatory Organization’s Statement of the Terms of Substance of the Proposed Rule Change

The Exchange proposes to amend its rule regarding options on the Nasdaq-100® Volatility Index within Options 4A, Section 12, Terms of Index Options Contracts.

The text of the proposed rule change is available on the Exchange’s Website at <https://listingcenter.nasdaq.com/rulebook/phlx/rules>, at the principal office of the Exchange, and at the Commission’s Public Reference Room.

II. Self-Regulatory Organization’s Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

In its filing with the Commission, the Exchange included statements concerning the purpose of and basis for the proposed rule change and discussed any comments it received on the proposed rule change. The text of these statements may be examined at the places specified in Item IV below. The Exchange has prepared summaries, set forth in sections A, B, and C below, of the most significant aspects of such statements.

¹ 15 U.S.C. 78s(b)(1).

² 17 CFR 240.19b-4.

A. Self-Regulatory Organization’s Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

1. Purpose

The Exchange proposes to amend the Nasdaq-100[®] Volatility Index (“Volatility Index”) within Options 4A, Section 12, Terms of Index Options Contracts. Specifically, the Exchange proposes to amend the calculation of the final settlement price for VOLQ options, the Closing Volume Weighted Average Price or “Closing VWAP,” in the event any of the thirty-two underlying Nasdaq-100[®] index (“NDX”) component options do not have a trade/quote during the 300 second period of time (the “Closing Settlement Period”).

Background

The final settlement price for the Volatility Index is calculated on Wednesday of each week commencing at 9:32:010 A.M. on the expiration day, and continuing each second for the next 300 seconds (New York time).³ The settlement value for the Volatility Index is the Closing VWAP that is determined by reference to the prices and sizes of executed orders⁴ or quotes in the thirty-two underlying NDX component options⁵ on Phlx, Nasdaq ISE, LLC (“ISE”) and Nasdaq GEMX, LLC (“GEMX”)⁶ calculated at the opening of trading on the expiration date (usually a Wednesday). At the end of individual one-second time observations during the Closing Settlement Period, which commences at 9:32:010 on the expiration day (or 2.00.01

³ The exercise settlement amount would be equal to the difference between the final settlement price and the exercise price of the option, multiplied by \$100. Exercise would result in the delivery of cash on the business day following expiration.

⁴ The Exchange proposes to add rule text within Options 4A, Section 12(b)(6)(D) to further describe what is meant by executed orders. Today, the rule text states, “Executed orders shall include simple orders and complex orders however, individual leg executions of a complex order will only be included if the executed price of the leg is at or within the NBBO.” The proposed change will be described in the proposal section.

⁵ Dependent upon movement in the Nasdaq-100 Index, all of the Closing Settlement Period index (VOLS) thirty-two underlying NDX component options can change every second making live market final settlement replication unfeasible over 300 seconds.

⁶ The Volatility Index’s component NDX options are listed on Phlx as well as on the Exchange’s affiliates, ISE and GEMX.

minutes after the open of trading in the event trading does not commence at 9:30:000 A.M. ET),⁷ and continues each second for the next 300 seconds, the number of contracts resulting from orders⁸ and quotes executed on Phlx, ISE and GEMX at each price during the observation period is multiplied by that price to yield a Reference Number. All Reference Numbers are then summed, and that sum is then divided by the total number of contracts traded during the observation period [Sum of (contracts traded at a price x price) ÷ total contracts traded)] to calculate a Volume Weighted Average Price for that observation period (a “One Second VWAP”) for that component option. If no transactions occur on Phlx, ISE and/or GEMX, during any one-second observation period, the NBBO midpoint at the end of the one second observation period will be considered the One Second VWAP for that observation period for purposes of this settlement methodology. Specifically, the Closing VWAP would seek the best bid and best offer (which may consist of a quote or an order) from among the listing markets (Phlx, ISE and GEMX markets). Each One Second VWAP for each component option is then used to calculate the Volatility Index, resulting in the calculation of 300 sequential Volatility Index values. Finally, all 300 Volatility Index values are arithmetically averaged (i.e., the sum of 300 Volatility Index calculations is divided by 300) and the resulting figure is rounded to the nearest .01 to arrive at the settlement value disseminated under the ticker symbol “VOLS.”⁹

Proposal

The Exchange proposes to amend the Closing VWAP to provide for an alternative calculation of the Closing Settlement Period if during any one second of the Closing Settlement

⁷ If the Exchange is unable to publish a settlement value by 12:00 P.M. (New York Time) due to a trading halt, the Exchange will determine and publish a value on its website. In the event of a trading halt, the Exchange will commence the calculation of the settlement window beginning 2.00.01 minutes after the re-opening of trading. See Options 4A, Section 12(b)(6)(D)(II).

⁸ Executed orders include simple orders and complex orders, however, individual leg executions of a complex order will only be included if the executed price of the leg is at or within the NBBO.

⁹ See Options 4A, Section 12(b)(6)(D)(II), “Terms of Option Contracts.”

Period any of the thirty-two NDX option series does not have a trade/quote. The alternative observation window would be part of the proposed new calculation of the Closing Settlement Period. The Exchange would add the alternate observation window to the existing calculation of the Closing VWAP.

First, the Exchange proposes if, during any one second of the observation period, any of the thirty-two NDX option series used for Closing VWAP does not have a trade/quote, the index calculator would look back and use the most recent published quote¹⁰ midpoint during that day for the One Second VWAP for the option component that does not have a trade/quote. If there is no One Second VWAP to utilize for any of the thirty-two NDX option series during the Closing Settlement Period, then the index calculator will consider that Closing Settlement Period invalid and will be unable to determine a Closing VWAP at that time.

Second, in the event the Closing Settlement Period is invalid and a Closing VWAP cannot be determined, the index calculator will then roll the Closing Settlement Period forward by one second and determine if there is a One Second VWAP for each of the thirty-two NDX option series for all 300 consecutive seconds of the new Closing Settlement Period. If there is a One Second VWAP for all of the thirty-two NDX option series for all 300 consecutive seconds, a Closing VWAP will be calculated. If a One Second VWAP is not present for all of the thirty-two NDX option series during the new observation period, the index calculator will again roll the Closing Settlement Period forward by one second. The index calculator would continue to roll the Closing Settlement Period forward by one second until such time as it is able to capture a One Second VWAP for each of the thirty-two NDX option series for all 300 consecutive seconds. At that time, a Closing VWAP will be calculated.

The proposal seeks to create an automated, non-discretionary process by which the Exchange would determine the Closing VWAP in the event any of the thirty-two underlying

¹⁰ Only quotes would be considered, not trades. The Exchange believes that quotes are more reflective of true market value since the index calculator would look back.

NDX component options do not have a trade/quote during the Closing Settlement Period. By creating an automated process, the Closing VWAP would be calculated consistently with the proposed rule. The Exchange does not anticipate utilizing the alternative Closing VWAP calculation on a regular basis. In fact, a review of 43 expiration dates¹¹ from January 2018 through July 2021 revealed invalid values for only 2 expiration dates.¹² On both of the expiration dates, the Exchange would have obtained a One Second VWAP for the component by looking forward because the look back did not contain a quote for the component that was missing a One Second VWAP.

In the event of a trading halt in one or more options, excluding a trading halt in all Nasdaq-100 index options, prior to the completion of the Closing Settlement Period, the Exchange would continue to look back for a One Second VWAP prior to looking forward. The Exchange believes that it is important to maintain a consistent process for obtaining missing values for the Closing VWAP. As noted above, the Exchange does not believe the alternative method would be utilized with any frequency, rather it should be utilized infrequently. In the event a trading halt caused Market Makers to not submit a Valid Width Quote in certain components during the Opening Process,¹³ the alternative methodology would look forward to obtain a value. Also, the Exchange would utilize a quote from the Opening Process only in the event an options series was able to open. If the Opening Process did not complete for an options series, there would be no value to obtain for a component during a look back.¹⁴

Today, Options 4A, Section 12(b)(6)(D)(II) provides, “If the Exchange is unable to publish a settlement value by 12:00 p.m. (New York time) due to a trading halt, the Exchange

¹¹ The Exchange reviewed the 9,660 NBBO inputs for the VOLS computation from 9:32.01 for the five minute Closing Settlement Period for each expiration date.

¹² The expiration dates were March 18, 2020 and June 17, 2020. The Exchange notes that the options industry experience unprecedented volumes in 2020.

¹³ The Phlx Opening Process is described within Options 3, Section 8.

¹⁴ The Closing Settlement Period occurs within seconds of the completion of the Opening Process.

will commence the calculation of the settlement window beginning 2.00.01 minutes after the re-opening of trading and publish that value on its website.”¹⁵ The Exchange proposes to replace this rule text with language which provides, “In the event of a trading halt in all Nasdaq-100 index options, the Exchange would commence the calculation of the settlement window beginning 2:00:01¹⁶ minutes after the re-opening of trading and publish that value on its website. In this scenario, the Exchange would not look back prior to the trading halt.” The Exchange’s proposal amends the current sentence to eliminate the 12:00 p.m. timeframe which does not consider all possible scenarios. A re-opening could occur anytime during the trading day. Further, specifically indicating a trading halt of the Nasdaq-100 index options in the rule text is more precise as the impact to the Nasdaq-100 index options is a direct concern for VOLQ. The proposed language more directly expands upon the manner in which the Closing VWAP will be handled in the event of a trading halt.

While the Exchange believes that the Volatility Index Closing VWAP has exceedingly high hurdles for potential manipulation, the proposed amendments would provide for a Closing Settlement Period, which has published liquidity for all of the thirty-two NDX option series used for the Closing VWAP. This proposed amendment would permit the index calculator to seek a One Second VWAP by first looking back for the most recent published quote midpoint for that option that had no trade/quote. In the event the Closing Settlement Period is invalid and a Closing VWAP cannot be determined, the index calculator will then continuously roll the Closing Settlement Period forward by one second until there is a One Second VWAP for all of the thirty-two NDX option series for all 300 consecutive seconds. This proposed change is designed to ensure that all thirty-two NDX components have a One Second VWAP for the calculation of the Closing VWAP.

¹⁵ See Phlx Options 4A, Section 12(b)(6)(D).

¹⁶ The time when the Exchange will commence the calculation of the settlement window was corrected from 2.00.001 minutes to 2:00:01 minutes. The calculation begins on the second.

For example, assume that during the first 59 seconds of the observation period, beginning at 9:32:01 A.M., all thirty-two NDX option components had a One Second VWAP. During the 60th second, the required NDX component June 18, 2021 14,100 call does not have a trade and has a market of \$0.00 bid @ \$0.00 offer. The index calculator would look back to the most recent quote, which occurred at 09:32:57 A.M. and would use that quote in the calculation to determine a One Second VWAP for the 60th second (09:33:00 A.M.). However, if during the look back, no quote has occurred since market open, the observation period up to and including the 60th second would be considered invalid and the new observation period would begin with the next second. In that case, the new observation period would begin at 09:33:01 A.M. and would continue for 300 seconds as long as there is a One Second VWAP which can be determined for all 32 NDX component options.

During the scenario above, if during the 58th, 59th, and 60th second, the required NDX component June 18, 2021 14,100 call does not have a trade and has a market of \$0.00 bid @ \$0.00 offer, then the index calculator would look back to the most recent quote which occurred at 09:32:57 A.M. and would use that value in the calculation to determine the One Second VWAP for the 58th, 59th, and 60th second.

The Exchange believes that its proposal would ensure that the Closing VWAP is calculated using options with sufficient liquidity for each of the thirty-two NDX components by seeking component values that are represented by trades and/or quotes. The Exchange believes that initially looking back for the most recent published quote midpoint for that option will ensure an efficient price for that option component.¹⁷ If the Exchange is unable to obtain a One Second VWAP for any of the thirty-two NDX option series during the Closing Settlement Period, the Exchange will invalidate the Closing Settlement Period and move on to calculate the Closing VWAP utilizing a forward rolling observation period of one second.

¹⁷ The Exchange's calculation is dependent upon values for the 32 component options.

The Exchange believes rolling the Closing Settlement Period forward by one second to obtain a One Second VWAP for each of the thirty-two NDX option series for all 300 consecutive seconds of the new observation period would ensure that the Closing VWAP is calculated using sufficient liquidity for each of the thirty-two NDX components by seeking trades and/or quotes in a new observation period. Utilizing a one second period of time to acquire a new observation window would allow the Exchange to utilize an observation window closest in time to the original window. Also, moving forward in increments of one second, as necessary, would serve to methodically move through the trading day for a potential observation window that would satisfy the Exchange's liquidity requirements. This method would continue to assess the entire field of NDX options prices each second to select specific listed NDX options to obtain the prices of synthetic precisely at-the-money options. As with the initial Closing Settlement Period, since the market is subject to constant change during three hundred individual one-second time periods for which listed options will be included in Closing VWAP, market participants cannot predict which option components will be included because that would entail predicting where the NDX price level (a function of predicting the price of all one-hundred component stocks) will be at the end of each of the three hundred individual one-second time periods. In addition, the Exchange notes that the look back period would likely not be subject to manipulation as the historical information would only be utilized in the event that liquidity was unavailable in the original observation window, which contains options components, which cannot be predicted.

The Exchange reiterates that it is unlikely that the Volatility Index Closing VWAP could be manipulated. In particular, because the thirty-two component Volatility Index option inputs¹⁸ are reviewed each second as the market changes to determine the at-the-money strikes (meaning that Volatility Index components could change 300 times during the Closing Settlement Period),

¹⁸ The Exchange notes that due to the number of proposed components, the mathematical formula would prevent the Volatility Index from exceeding 12.5% in any single component and 43.5% for the top 5 components.

market participants could manipulate the Closing VWAP only if they could replicate such value by guessing exact market moves over an extended period of 300 million microseconds. Because the likelihood of replication is extremely low, the Exchange believes that it is unlikely the Closing VWAP could be manipulated.

Nonetheless, the Exchange, in its normal course of surveillance, will monitor for any potential manipulation of the Volatility Index settlement value according to the Exchange's current procedures. Additionally, the Exchange would monitor the integrity of the Volatility Index by analyzing trades, quotations, and orders that affect any of the 300 calculated reference prices for any of the NDX option series used for the Closing VWAP for potential manipulation on the Exchange.

Finally, the Exchange proposes to amend the term "executed orders" at Options 4A, Section 12, (b)(6)(D)(II) which currently provides, "Executed orders shall include simple orders and complex orders however, individual leg executions of a complex order will only be included if the executed price of the leg is at or within the NBBO." The Exchange proposes to instead provide, "Executed orders shall include simple orders and complex orders (excluding out-of-sequence and late trades), however, individual leg executions of a complex order will only be included if the executed price of the leg is at or within the NBBO." The Exchange desires to exclude out-of-sequence and late trades to avoid potential stale data in the Closing VWAP calculation.

Implementation

The Exchange proposes to issue an Options Trader Alert announcing the day it will launch options on Nasdaq-100 Volatility Index. The Exchange initially indicated that it would launch these options by Q3 2021.¹⁹ At this time, the Exchange proposes to launch VOLQ

¹⁹ See Securities Exchange Act Release No. 91781 (May 5, 2021), 86 FR 25918 (May 11, 2021) (SR-PHLX-2020-41) (Notice of Filing of Amendment Nos. 1 and 2 and Order Granting Accelerated Approval of a Proposed Rule Change, as Modified by Amendment Nos. 1 and 2, To List and Trade Options on a Nasdaq-100 Volatility Index).

options on or before March 31, 2022.

2. Statutory Basis

The Exchange believes that its proposal is consistent with Section 6(b) of the Act,²⁰ in general, and furthers the objectives of Section 6(b)(5) of the Act,²¹ in particular, in that it will permit options trading in the Volatility Index pursuant to rules designed to prevent fraudulent and manipulative acts and practices and promote just and equitable principles of trade by amending its Volatility Index to create additional alternative observations periods to arrive at a Closing VWAP in the event that any of the thirty-two NDX option series used for Closing VWAP do not have a One Second VWAP during the five minute Closing Settlement Period. Phlx's proposal to amend the Closing VWAP by proposing alternate observations periods would ensure a Closing Settlement Period which has published liquidity for all of the thirty-two NDX option series used for Closing VWAP. The Exchange notes that this alternate methodology may be utilized where there is no liquidity in any of the thirty-two NDX option series used for Closing VWAP. This may be caused by an Exchange system issue, market maker issue, or some news or halt in an underlying.

The proposal would promote just and equitable principles of trade by creating an automated, non-discretionary process by which the Exchange would determine the Closing VWAP in the event any of the thirty-two underlying NDX component options do not have a trade/quote during the Closing Settlement Period. The Closing VWAP would be calculated consistently. The Exchange anticipates the alternative Closing VWAP calculation would be utilized infrequently. In the event of a trading halt in one or more options, excluding a trading halt in all Nasdaq-100 index options, prior to the completion of the Closing Settlement Period, the Exchange's proposal to look back for a One Second VWAP, prior to looking forward, is consistent with the Act because the Exchange's process would be consistent for obtaining

²⁰ 15 U.S.C. 78f(b).

²¹ 15 U.S.C. 78f(b)(5).

missing values for the Closing VWAP. Also, in the event a trading halt caused Market Makers to not submit a Valid Width Quote in certain components during the Opening Process, the alternative methodology would look forward to obtain a value. Also, the Exchange would utilize a quote from the Opening Process only in the event an options series was able to open. If the Opening Process did not complete for an options series, there would be no value to obtain for a component during a look back.²²

This method would continue to assess the entire field of NDX options prices each second to select specific listed NDX options to obtain the prices of synthetic precisely at-the-money options. As with the initial settlement window, since the market is subject to constant change during three hundred individual one-second time periods for which listed options will be included in Closing VWAP, market participants cannot predict which options components will be included because that would entail predicting where the NDX price level (a function of predicting the price of all one-hundred component stocks) will be at the end of each of the three hundred individual one-second time periods. The Exchange reiterates that it is unlikely that the Volatility Index Closing VWAP could be manipulated. In particular, because the thirty-two component Volatility Index option inputs are reviewed each second as the market changes to determine the at-the-money strikes (meaning that Volatility Index components could change 300 times during the settlement period), market participants could manipulate the Closing VWAP only if they could replicate such value by guessing exact market moves over an extended period of 300 million microseconds. Because the likelihood of replication is extremely low, the Exchange believes that it is unlikely the Closing VWAP could be manipulated. Similarly, with respect to the look back period, it would be unlikely that manipulation could occur as the historical information would only be utilized in the event that liquidity was unavailable in the original observation window, which contains options components which cannot be predicted.

²² The Closing Settlement Period occurs within seconds of the completion of the Opening Process.

Nonetheless, the Exchange, in its normal course of surveillance, will monitor for any potential manipulation of the Volatility Index Closing VWAP and monitor the integrity of the Volatility Index by analyzing trades, quotations, and orders that affect any of the 300 calculated reference prices for any of the NDX option series used for the Closing VWAP for potential manipulation on the Exchange.

Utilizing a time period of one second to acquire a new observation window would allow the Exchange to utilize an observation window closest in time to the original window. Also, moving forward in increments of one second, as necessary, would serve to methodically move through the trading day for a potential observation window that would satisfy the Exchange's liquidity requirements.

The Exchange's proposal to amend the term "executed orders" to exclude out-of-sequence and late trades is consistent with the Act as these values may represent potential stale data in the Closing VWAP calculation. The Exchange believes the midpoint better reflects the price of a component.

Finally, the Exchange's proposal to amend current Options 4A, Section 12(b)(6)(D)(II) to remove the 12:00 p.m. deadline for publishing a settlement value is consistent with the Act because a re-opening could occur anytime during the trading day and, therefore, citing specifically to a 12:00 p.m. timeframe does not consider all possible scenarios. Further, specifically indicating a trading halt of the Nasdaq-100 index options in the rule text is more precise as the impact to the Nasdaq-100 index options is a direct concern for VOLQ. The proposed language more directly expands upon the manner in which the Closing VWAP will be handled in the event of a trading halt.

B. Self-Regulatory Organization's Statement on Burden on Competition

This proposed rule change does not impose any burden on competition that is not necessary or appropriate in furtherance of the purposes of the Act. The Exchange notes that the proposed alternative observation windows will facilitate the listing and trading of the Volatility

Index by ensuring liquidity for each of the option components. The proposed structure will enhance competition among market participants, to the benefit of investors and the marketplace.

C. Self-Regulatory Organization's Statement on Comments on the Proposed Rule Change Received from Members, Participants, or Others

No written comments were either solicited or received.

III. Date of Effectiveness of the Proposed Rule Change and Timing for Commission Action

Within 45 days of the date of publication of this notice in the Federal Register or within such longer period (i) as the Commission may designate up to 90 days of such date if it finds such longer period to be appropriate and publishes its reasons for so finding or (ii) as to which the Exchange consents, the Commission shall: (a) by order approve or disapprove such proposed rule change, or (b) institute proceedings to determine whether the proposed rule change should be disapproved.

IV. Solicitation of Comments

Interested persons are invited to submit written data, views, and arguments concerning the foregoing, including whether the proposed rule change is consistent with the Act. Comments may be submitted by any of the following methods:

Electronic comments:

- Use the Commission's Internet comment form (<http://www.sec.gov/rules/sro.shtml>); or
- Send an e-mail to rule-comments@sec.gov. Please include File Number SR-Phlx-2021-56 on the subject line.

Paper comments:

- Send paper comments in triplicate to Secretary, Securities and Exchange Commission, 100 F Street, NE, Washington, DC 20549-1090.

All submissions should refer to File Number SR-Phlx-2021-56. This file number should be included on the subject line if e-mail is used. To help the Commission process and review your comments more efficiently, please use only one method. The Commission will post all comments on the Commission's Internet website (<http://www.sec.gov/rules/sro.shtml>). Copies

of the submission, all subsequent amendments, all written statements with respect to the proposed rule change that are filed with the Commission, and all written communications relating to the proposed rule change between the Commission and any person, other than those that may be withheld from the public in accordance with the provisions of 5 U.S.C. 552, will be available for website viewing and printing in the Commission's Public Reference Room, 100 F Street, NE, Washington, D.C. 20549 on official business days between the hours of 10:00 a.m. and 3:00 p.m. Copies of the filing also will be available for inspection and copying at the principal office of the Exchange. All comments received will be posted without change. Persons submitting comments are cautioned that we do not redact or edit personal identifying information from comment submissions. You should submit only information that you wish to make available publicly. All submissions should refer to File Number SR-Phlx-2021-56 and should be submitted on or before [insert date 21 days from publication in the Federal Register].

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.²³

J. Matthew DeLesDernier,

Assistant Secretary.

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²³ 17 CFR 200.30-3(a)(12).